Carrier for Aqueous Media

Claims

1. A carrier, in the form of particles, that can be loaded with aqueous media, the particles being made of a porous hydrophobic polymer substrate, whereby the particles have a mean particle size between 50 µm and 5000 µm and an at least partly open-pore structure with a mean pore diameter between 1 µm and 200 µm, and whereby the particulate carrier has a loadability with water, determined by bringing it into contact with water, of 10 wt.% to 95 wt.% relative to the total weight of the loaded carrier.

2. Carrier according to Claim 1, characterised in that the porous polymer substrate is hydrophilised over least part of its entire surface, comprising the outer surfaces and the surface of its pores.

3. Carrier according to one or both of Claims 1 and 2, characterised in that the porous polymer substrate is hydrophilised over essentially its entire surface, comprising the outer surfaces and the surface of its pores.

4. Carrier according to one or both of Claims 2 and 3, characterised in that the porous polymer substrate is hydrophilised by coating with a surfactant.

5. Carrier according to Claim 4, characterised in that the surfactant is a non-ionic surfactant chosen from the group of fatty acid glycerides, polyglycol ethers, fatty acid glycol esters, fatty acid mono-, di- or triesters of sorbitan, and fatty acid amides.

6. Carrier according to Claim 5, characterised in that the non-ionic surfactant is a fatty acid glyceride.

7. Carrier according to Claim 5, characterised in that the non-ionic surfactant has an HLB value higher than 7.

8. Carrier according to Claim 5, characterised in that the non-ionic surfactant has an HLB value of 10 to 15.

9. Carrier according to Claim 4, characterised in that the surfactant is an anionic surfactant selected from the group of soaps, alkyl sulfates, alkane sulfonates, alkyl aryl sulfonates or alkyl benzene sulfonates, α-olefin sulfonates, fatty alcohol sulfonates, fatty alcohol ether sulfonates and dialkyl sulfosuccinates.

10. Carrier according to Claim 4, characterised in that the surfactant is a cationic surfactant selected from the group of quaternary ammonium compounds.

11. Carrier according to one or more of Claims 4 to 10, characterised in that the concentration of the surfactant in the carrier lies between 0.1 wt.% and 15 wt.% relative to the weight of the carrier.

12. Carrier according to one or more of Claims 1 to 11, characterised in that the polymer of which the polymer substrate is made is a polyolefin, a fluoropolymer, a styrene polymer, or a copolymer of these polymers.

13. Carrier according to one or more of Claims 1 to 12, characterised in that it possesses essentially the same porous configuration as the porous polymer substrate.

14. Carrier according to one or more of Claims 1 to 13, characterised in that the porosity lies in the range between 30 vol.% and 90 vol.%, and the loadability with water between 25 wt.% and 90 wt.% relative to the total weight of the loaded carrier.

15. Carrier according to one or more of Claims 1 to 14, characterised in that the particles have a mean pore diameter in the range between 5 μm and 100 μm.

16. Carrier according to one or more of Claims 1 to 15, characterised in that it has a characteristic loading time for water of 120 minutes at most.

17. Carrier according to one or more of Claims 1 to 15, characterised in that it has a characteristic loading time for water of 90 minutes at most.

18. Method for production of a carrier loadable with aqueous media and in the form of particles based on a hydrophobic polymer, the carrier having a loadability with water, as determined by bringing it into contact with water, of 10 wt.% to 95 wt.% relative to the total weight of the loaded carrier, comprising the steps:

- selection of a porous hydrophobic polymer substrate in the form of particles, the polymer substrate having a mean particle size between 50 µm and 5000 µm and an at least partly open-pore structure with a mean pore diameter between 1 µm and 200 µm;

- hydrophilisation of the particulate polymer substrate over at least part of its total surface, comprising the outer surface and the surface of its pores, to obtain the carrier loadable with aqueous media.

19. Method according to Claim 18, characterised in that the carrier loadable with aqueous media possesses essentially the same porous configuration as the hydrophobic polymer substrate.

20. Method according to Claim 18 or 19, characterised in that the polymer substrate for hydrophilisation is impregnated over at least part of its total surface, comprising the outer surface and the surface of its pores, with a solution of a surfactant in a volatile solvent or solvent mixture that is essentially inert to the polymer substrate and does not dissolve it to any significant extent.

21. Method according to Claim 20, characterised in that the solvent or solvent mixture has a boiling point not exceeding 100°C.

22. Method according to one or both of Claims 20 and 21, characterised in that an organic solvent or solvent mixture is used as the solvent or solvent mixture.

23. Method according to Claim 22, characterised in that the solvent or solvent mixture is selected from the group of alcohols, ketones and esters.

24. Method according to one or more of Claims 20 to 23, characterised in that a non-ionic surfactant selected from the group of fatty acid glycerides is used for the hydrophilisation.

25. Method according to one or both of Claims 20 and 21, characterised in that water is used as the solvent.

26. Method according to Claim 25, characterised in that a water-soluble, non-ionic surfactant with an HLB value higher than 7 is used as the surfactant.

27. Method according to one or more of Claims 20 to 26, characterised in that the concentration of the surfactant in the solution is between 1 wt.% and 10 wt.%.

28. Method according to one or more of Claims 18 to 27, characterised in that the polymer substrate is made from a polyolefin, a fluoropolymer, a styrene polymer, or a copolymer of these polymers.

29. Method according to one or more of Claims 18 to 28, characterised in that the polymer substrate has a mean pore diameter in the range between 5 µm and 100 µm.

30. Method according to one or more of Claims 18 to 29, characterised in that the polymer substrate has a volume porosity between 30 vol.% and 90 vol.%.

31. Method for production of a storage device loaded with an aqueous medium and based on a hydrophobic polymer, comprising at least the steps:

- selection of a porous hydrophobic polymer substrate in the form of particles, the polymer substrate having a mean particle size between 50 µm and 5000 µm and an at least partly open-pore structure with a mean pore diameter between 1 µm and 200 µm,

- hydrophilisation of the particulate polymer substrate over at least part of its total surface, comprising the outer surface and the surface of its pores, and

- loading of the hydrophilised particulate polymer substrate with the aqueous medium to the extent of 10 wt.% to 95 wt.% relative to the total weight of the loaded storage device, by bringing the hydrophilised polymer substrate into contact with the aqueous medium.

32. Method for producing a storage device loaded with an aqueous medium and based on a hydrophobic polymer, comprising at least the steps:

- selection of a porous hydrophobic polymer substrate in the form of particles, the polymer substrate having a mean particle size between 50 µm and 5000 µm and an at least partly open-pore structure with a mean pore diameter between 1 µm and 200 µm;

- direct loading of the hydrophobic polymer substrate with the aqueous medium to the extent of 10 wt.% to 95 wt.% relative to the total weight of the loaded storage device, by bringing the hydrophobic polymer substrate into contact with the aqueous medium, the latter containing a water-soluble surfactant.

33. Storage device consisting of particles and loaded with an aqueous medium to the extent of 10 wt.% to 95 wt.% relative to the total weight of the loaded storage device, whereby the particles are made from a hydrophobic polymer substrate, have a mean particle size between 50 µm and 5000 µm, and possess an at least partly open-pore structure and a mean pore diameter between 1 µm and 200 µm.